"To the young mind everything is individual, stands by itself...later remote things cohere and flower out from one stem."

Ralph Waldo Emerson

The OWLS name and program are used with permission from the Kansas Department of Wildlife and Parks Chickadee Checkoff. The authors have graciously allowed the West Virginia Diversity Program to modify the OWLS program for West Virginia.

Prepared by Scott Hillard, George Potts and Ken Brunson, December 1991.
Revised September 1993.
Adapted for West Virginia by J. Scott Butterworth, Kathleen C. Leo and Carmen Blumberg
August 1994, Revised 1995, 1998, 2000, 2001, and 2003.

In Cooperation with

Project Learning Tree
Project WILD

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WEST VIRGINIA DIVERSITY PROGRAM
OUTDOOR WILDLIFE LEARNING SITES (OWLS) PROGRAM

INTRODUCTION

The West Virginia Wildlife Resources Section is responsible for stewardship of the state's wildlife resources and an important part of its mission is to enhance the public's appreciation for wildlife. Effective education is central to this effort. Each generation of our youth, in due time, assumes responsibility for our natural resources. This responsibility includes the conservation of wildlife and their habitats. In order to prepare our youth to become responsible citizens who practice responsible conservation of our natural resources, it is necessary to emphasize educational programs that teach school-age children the principles of ecology. Relating the needs of wildlife with human needs instills the interconnectedness between humans and their natural environment. One of the best ways to accomplish this is to bring the students into contact with wildlife and their habitats.

Schools are in charge of educating our youth about science, math, English, language arts and social skills. The best way to teach and learn about nature is to provide the students with natural outdoor settings. It is well established that "hands on" activities greatly enhance a student's ability to understand and remember concepts and facts.

Many instructors are limited because of time constraints, or other reasons, from transporting classes to distant natural areas for biological study. However, many schools have property available right outside their doors that could be used to develop outdoor learning laboratories. Some schools have demonstrated how this can be accomplished on their immediate school grounds and how successful it is in educating students and giving them more insight and appreciation of nature. These outdoor classrooms provide interdisciplinary education across many different subjects.

Nongame wildlife are animals which are not typically taken for sport, fur or food. Rare and endangered species, such as our nation's symbol, the bald eagle, are nongame species, but so are the many fascinating creatures that enhance our lives with sounds and sights on a daily basis. These include the birds singing near our homes, a chorus of frogs, flashes of colorful butterflies on a summer's day and the delicately colored wildflowers carpeting meadows in early fall. There are over 500 vertebrate nongame wildlife species in the state, thousands of invertebrates and 2300 vascular plants. As well as enriching the lives of all West Virginia citizens, nongame wildlife and plants serve as an integral part in mother nature's scheme to maintain the unique beauty and environmental integrity of our state. To ensure the continued existence of wildlife and botanical resources is just one of the many responsibilities of the West Virginia Division of Natural Resources' Wildlife Resources Section, Wildlife Diversity Program (WDP). The DNR's effectiveness in meeting these responsibilities is directly related to the involvement and support of the citizens of West Virginia. The WDP's Outdoor Wildlife Learning Sites Program is one such way to involve local conservation clubs, businesses and community members in projects

that will aid in the conservation of West Virginias nongame wildlife and botanical resources.

In addressing the nongame needs of the state, WDP has initiated the Outdoor Wildlife Learning Sites (OWLS) program to help increase student exposure to native wildlife and plant communities. The WDP, with the guidance of the West Virginia Wildlife Diversity Citizens Advisory Council, comprised of experts and interested citizens appointed by the Governor, has committed funds each year to establish OWLS on school grounds throughout West Virginia. OWLS grants provide up to $2,000 for any school desiring to create this type of outdoor learning laboratory after meeting standards established in this application booklet.

Benefits of Developing Wildlife Habitat at Schools

Student Benefits

- π Enlivens school subjects; knowledge is applicable to the real world
- π Promotes creative learning by students; student can choose to do projects
- π Interdisciplinary: math, science, literature, social skills
- π Unlimited learning opportunities all year

Teacher Benefits

- π Expands teaching strategies for each subject
- π Livens and improves interaction between students and teacher
- π Increases satisfaction in teaching (applied knowledge reinforces learning)
- π Accessible: no need to use a bus or prepare for a trip
- π Teaching is brought to life by being outdoors
- π Teachers learn along with students

Wildlife Benefits

- π Creates habitat for wildlife
- π Wildlife is an environmental barometer; if wildlife declines, the environmental quality of human life also declines

Society Benefits

- π Creates responsible citizenship based on ecological literacy
- π Sets a positive example for the community; improves school grounds
- π Promotes responsible action

THE DETAILS

Initial Questions

What is an OWLS?

OWLS is an acronym for Outdoor Wildlife Learning Sites. OWLS are outdoor environmental/wildlife laboratories, at or near schools, consisting of one or more native habitat features. These areas are developed to attract and provide homes for a variety of native wildlife species and to facilitate multi-disciplinary learning opportunities for students. The program involves numerous organizations, agencies and community members, all with the purpose of fostering a better understanding and appreciation of our wildlife and the natural world in our youth.

Who is eligible to receive OWLS funding?

Any grade school, intermediate school, high school, or special education school, whether public or private, may apply for OWLS funding. The purpose of the OWLS program is to facilitate the development of outdoor learning laboratories on as many school grounds as possible. OWLS is a long-term effort that will involve many different groups and types of educational facilities.

How much money can be provided from the WDP for OWLS funding?

The WDP will make up to $2,000 available per school. Schools are encouraged to seek additional funding from other agencies, organizations and benefactors.

When should one apply for OWLS funding?

The closing date for applications is November 1. Funding for projects will be awarded on a competitive basis. Judging will be done by WDP staff. Because of limited funds, unsuccessful applicants are encouraged to resubmit new proposals in the following years. Each school has 2 years to complete their OWLS project after receiving their OWLS funds.

How are proposals rated?

The most important aspect of any OWLS project is that it benefit native nongame wildlife and/or botanical resources in West Virginia and that it be utilized for environmental education. Proposals must also include the following:

use of native plants

clear site drawings

8 or more committee members

resource personnel

long-term commitment to the project

teachers trained in Project WILD or Project Learning Tree

other funding sources

publicity plans

site available to the public

community involvement

clear and reasonable budget

education objectives

How to Apply

Submit a proposal to the address below before November 1. See pg. 8 for proposal format. To receive additional booklets write to:

OWLS Coordinator
WDP
P.O. Box 67
Elkins, WV 26241
(304) 637-0245.

Steps for Participation in the OWLS Program

- ~ School requests information about OWLS
- ~ Guidelines and application sent to school
- ~ School forms an OWLS committee and selects an OWLS project director
- ~ Assess environmental attributes of the site
- ~ Determine potential projects based on assessment
- ~ Involve students in all aspects of the process
- ~ School OWLS committee prepares proposal
- ~ Proposal submitted to WDP OWLS program coordinator by November 1
- ~ West Virginia WDP staff evaluate proposal for funding
- ~ Funding contract paperwork is initiated with approved schools
- ~ Funding is provided in spring
- ~ WDP OWLS coordinator visits school OWLS site
- ~ Site preparation and planting begins
- ~ Follow up visit by OWLS program coordinator
- ~ Final Report with pictures, description of accomplishments, and receipts submitted to OWLS program coordinator

Tips from previous program years

Since the program's inception, nearly 100 schools in 40 counties have been awarded OWLS grants. Competition for funding has been keen and attention to proposal detail is important.

Some of the more common problems we have had with past proposals are as follows:

**Habitat Improvement vs. Construction*: OWLS funds should be used for wildlife habitat improvement and enhancement (ex. plantings, nest boxes, water sources, etc.) rather than for construction projects (ex. pavilions, bridges, boardwalks).

**Lack of Educational Objectives*

**Exotic vs. Native*: It is very important to plant native vegetation not only for the benefit of native wildlife and plant communities, but also to instill a responsible land use ethic in the students. For more information on native vegetation, see pages 33-41.

**Removal of Invasive Species*

**Lack of Information*:

- / Species of plants chosen (use both common and scientific names; use both genus and species in the scientific names)
- / Size of OWLS area
- / Current conditions and features of OWLS area before development occurs (ie. any vegetation, fixtures, soils, habitat types present, etc.)
- / Location of specific habitats (existing and planned) on site maps
- / Types of land-use in surrounding landscape (ex. agricultural, forested, suburban, urban, etc.)
- / Complete budget indicating exactly who will be paying for or donating each item

OWLS Overview

The following list is designed to help you obtain a basic understanding of the OWLS program and to assist you in developing your OWLS funding proposal. Use this booklet to help you with the following questions and directives.

1. What is an OWLS? (page 5)

2. Who is eligible to receive an OWLS grant? (page 5)

3. How much money can be provided from the WV Wildlife Diversity Program for an OWLS project? (page 5). List 5 other possible sources of funding for OWLS in your community.

4. When should one apply for OWLS funding? (page 5)

5. Where should you write to receive an application for OWLS funding? (page 6)

6. List 5 site features that you would like to develop at your school. (pages 31, 32-43) List the title of one educational activity for each of your 5 features. (Appendix A, page 52-55). Sketch your proposed OWLS area showing the location of your site features. (Figure 7b, page 13)

7. Who should be responsible for planning, implementing and maintaining your OWLS? (page 30)

8. Who should be on your OWLS committee? (page 30) Name the people from your school who should be on the OWLS committee.

9. List of agencies that can provide printed materials and resource people to help you develop your OWLS. (page 46). Visit those agencies, talk to their personnel about your OWLS and pick up materials that will be helpful in developing your OWLS.

10. Where should you write to receive Project WILD (PW) and Project Learning Tree (PLT) workshop information? (Appendix A, page 52)

11. Name a room in your school where you can establish your Wildlife Resource Center (WRC). (page 44) List 5 curricular materials, 5 pieces of equipment and 5 references that you would like to have in your WRC.

12. The date when grant paperwork must be sent back to the WDP (page 9).

13. What is involved in writing the final report (page 45).

How to Use this Booklet

The **Proposal Application** (beginning on page 8) should be copied for your use. All of the features described in the application can be found in the remaining pages of this booklet. Not only will this booklet help you to fill out the application, but it gives valuable advice and ideas for developing your outdoor classroom.

If you have difficulty filling out sections of the application, refer to the **Sample Application** (beginning on page 20).

Submission of Proposals

All applications for OWLS areas must be mailed and postmarked by November 1. Mail to OWLS Coordinator, WVDNR, P.O. Box 67, Elkins, WV 26241.

If you wish to receive additional copies of the Application Booklet, or know of another school interested in the program, please write to the above address.

If there are any questions about the application process, or if you need help with the development of your project, you can write or phone the OWLS Coordinator at the Elkins Office (304/637-0245, FAX 304/637-0250). Your suggestions and/or comments on the Application Booklet will be appreciated. Thank you and good luck.

Requirements

OWLS sites must use primarily plants native to West Virginia. Any exotic species used cannot be invasive or pose a threat to natural areas in the state.

Any printed materials or signs for your OWLS site must include the Wildlife Diversity Program as a sponsor.

All paperwork must be returned to the WDP within two (2) weeks of receipt or you will loose your grant.

Your final report must be returned to WPD by July 1st of the third year of the OWLS project (approximately 2 years after receiving funds). For example, if the application is submitted on November 1, 2005 the final report is due July 1, 2008. For information about the final report please see page 45.

PLEASE COPY THE PROPOSAL APPLICATION ON THE FOLLOWING PAGES FOR YOUR USE

West Virginia Division of Natural Resources Wildlife Diversity Program
Application for the
OUTDOOR WILDLIFE LEARNING SITES (OWLS) PROGRAM

(1) Provide the title of your **area**. The name does not have to be OWLS; be creative!

(2) Give the **school's address** and **phone number**.

(3) Supply the name of the **contact person** (project director) along with his/her **address, phone number, occupation**, and the **best time to be reached (REQUIRED!)**.

(4) List the **committee members** and their **titles** (e.g. 4th grade teacher, parent, etc.). This group must include at least 2 teachers, an administrator, a maintenance person, 2 students and 2 parents.

(5) List the **resource personnel** in your area who will help you develop and implement your site. You must have at least 1 biologist in this group.

(6) Specify the **goals** you plan on achieving including the features to be developed, activities to be implemented and the expected student outcome.

(7) Describe your **site location** and its **current features**, as well as the placement of the **OWLS features** you will be developing.

(7a) Provide a **diagram** of your **current site** and all of its features (e.g. faucet, trees, buildings, etc.) and its size. You may use a separate sheet if necessary.

(7b) Provide a **diagram** of your **site** with the **proposed OWLS features** (e.g. bird houses, butterfly and hummingbird gardens, pond, etc.) including the size of the area. You may use a separate sheet if necessary.

(8) Provide the **location(s)** of your **Wildlife Resources Center** where curriculum materials, equipment and references will be kept.

(9) **Site Use**: Provide a short narrative as to **who, how** and **when** the **site will be used.** Please include use by the community, clubs and organizations.

(9b) Describe some of the **activities** to be conducted on the site by the school including multi-disciplinary use by the classes.

(10) **In-service Training.**
(a) Number of people trained in Project WILD Have they used this training in the classroom? (b) Number of people trained in Project Learning Tree Have they used this training in the classroom? (c) Plans for **future training:**

(11) **Site Development:** List the start and completion dates for each feature to be developed on your site in the calendar provided. Also list any publicity events, continuing work on alternate funding, in-service training and maintenance of the area.	
Fall of Year 1	Apply for OWLS grant
Winter of Year 1	
Spring of Year 1	
Summer of Year 1	
Fall of Year 2	
Winter of Year 2	
Spring of Year 2	
Summer of Year 2	
Fall of Year 3	
Winter of Year 3	
Spring of Year 3	Turn in final report to the WVDNR by July 1

(12) **Budget**: Provide detailed budget worksheets indicating **current and/or pending support, in-kind services and local resources** from the OWLS program.

(12a) **Current/Pending Support**		
Source	**Support**	**Amount**

(12b) **In-kind Services** and **Local Resources**	
Source	**Support**

(12c) **Requested OWLS Funds** (use additional pages, if necessary).

Feature	**Supplies**	**#**	**Price/Item**	**Total**

(13) Describe how the group plans on:

(a) **Involving** the **community**.

(b) Gathering **publicity** for the area.

(14) List the **vegetation** to be planted in each area. Please include both common and scientific names. The OWLS program requires the use of primarily native plants. Use additional pages if necessary.

(15) Provide examples of **how** the group will **measure success** (e.g. student projects, use of the area by groups other than the school, number of nestlings hatched in bird boxes, etc.). A **final report**, including an evaluation of success and a financial accounting, is required by **July 1, of the third year of the program** (See pg. 45 for details).

Please mail completed application by **November 1** to:

OWLS
Wildlife Diversity Program
WV DNR Wildlife Resources Section
P.O. Box 67
Elkins, WV 26241

Sample Proposal

West Virginia Division of Natural Resources Wildlife Diversity Program
Application for the
OUTDOOR WILDLIFE LEARNING SITES (OWLS) PROGRAM

(1) Provide the **title** of your **area**. The name does not have to be OWLS; be creative!
Mountain Valley Outdoor Wildlife Learning Site

(2) Give the **school's address** and **phone number**.
Mountain Valley Elementary School 1 Watery Way Bumperton, WV 55555 (304) 555-1112

(3) Supply the name of the **contact person** (project director) along with his/her **address, phone number, occupation**, and the **best time to be reached**.
Robin Fox 4th Grade Teacher Box 321 Bumperton, WV 55555 (304) 234-7654 (Home) Planning Period: 11:15 a.m. - 12:30 p.m.

(4) List the **committee members** and their **titles** (e.g. 4th grade teacher, parent, etc). This group must include at least 2 teachers, an administrator, a maintenance person, 2 students and 2 parents.
Robin Fox, Chairperson Barbara Deer, Principal Sandra Plum, Librarian John Eagle, 5th grade science teacher Stan Spade, maintenance supervisor Susan Snail, 4th grade student Arthur Bunting, 5th grade student Alice Monarch, parent Cheryl Crowing, parent

(5) List the **resource personnel** in your area who will help you develop and implement your site. You must have at least 1 biologist in this group.

Alan Chenoweth, Mountain County Soil Conservationist, USDA
Janice Wheat, WV DNR Biologist
Sally Pamor, Mountain County Extension Service
Paul Ply, Mountain Valley Recreation Department
John Barry, Mountain Valley Garden Club
Ralph Knall, local naturalist

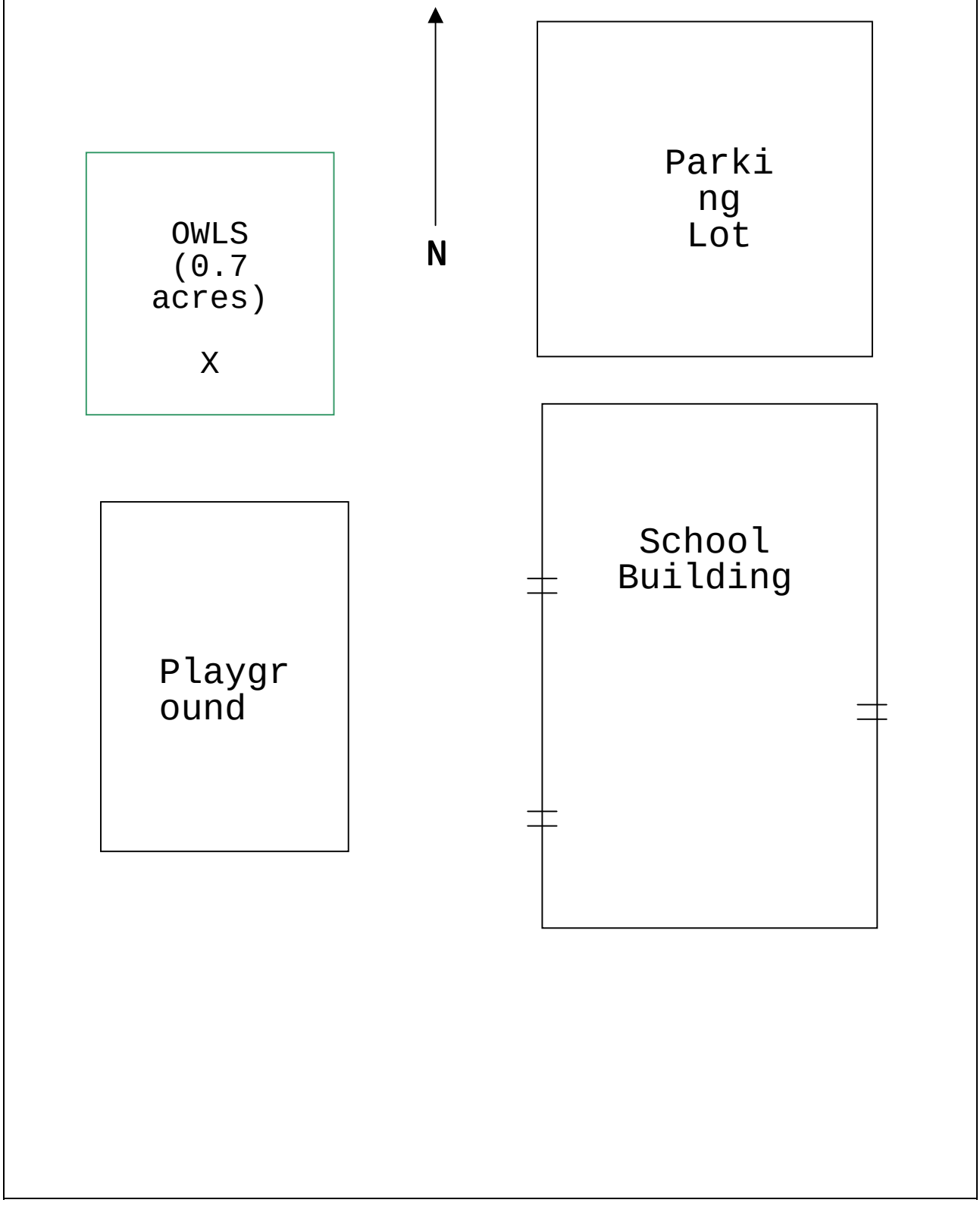
(6) Specify the **goals** you plan on achieving including the features to be developed, activities to be implemented and the expected student outcome.

Our goal is to develop features on the Mountain Valley OWLS which will attract wildlife for study by our students and members of our community to increase their appreciation for wildlife, develop an understanding of the dependency of wildlife on specific habitats, and comprehend the necessity to protect and/or restore habitats in order to increase wildlife diversity and numbers.

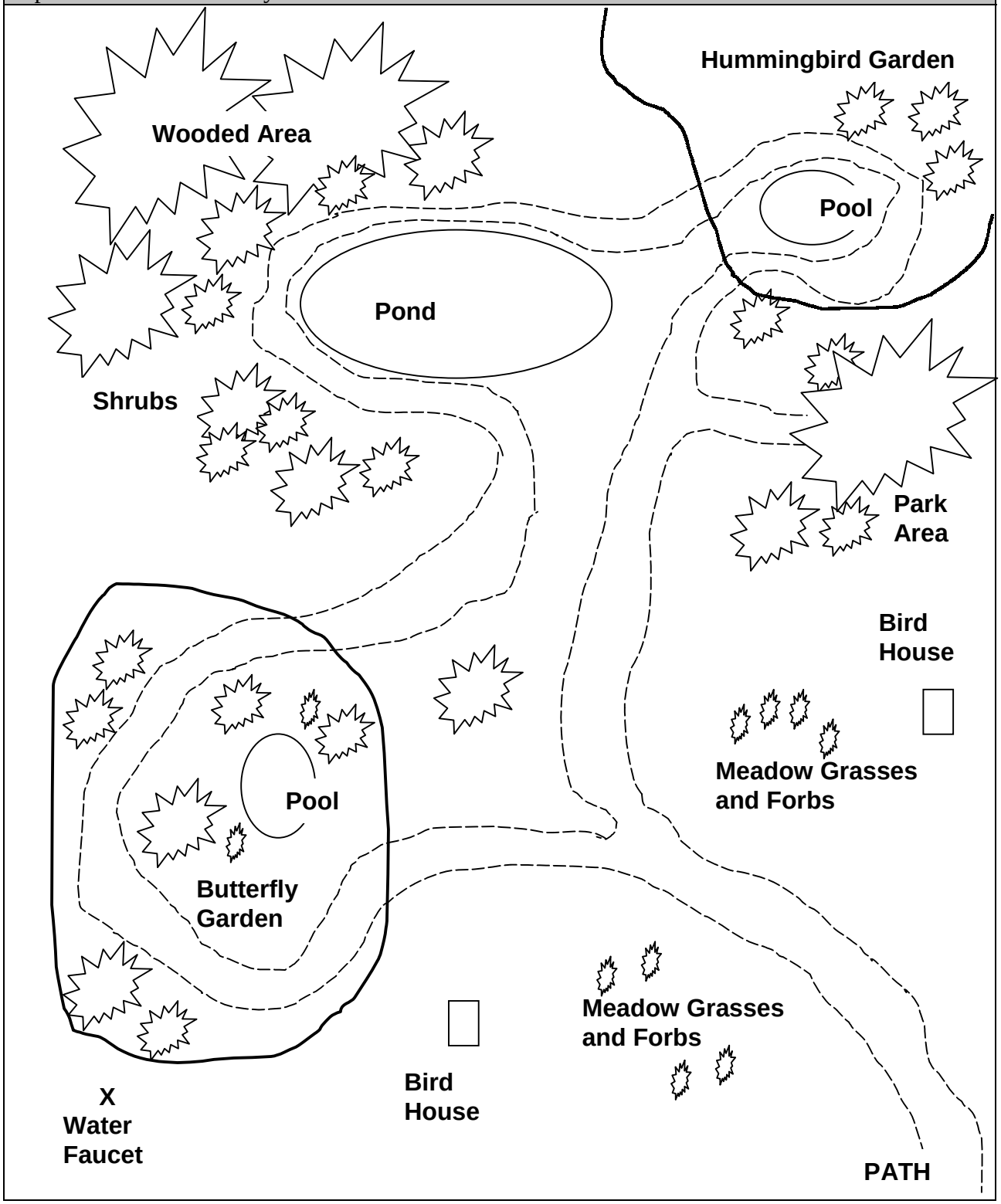
(7) Describe our **site location** and its **current features**, as well as the placement of the **OWLS features** you will be developing.

The Mountain Valley Outdoor Wildlife Learning Site is located on the north west corner of the Mountain Valley School grounds (See Figures 1 and 2). It is rectangular in shape and occupies nearly 0.7 acres. The site presently is covered with a thick stand of fescue grass and contains a water faucet with 100 feet of hose. Features will include a pond, a wooded area, hummingbird garden with pool, a park area, shrubland, butterfly garden with pool. All features will be connected by paths. Students, teachers, parents, and community volunteers will construct the features.

(7a) Provide a **diagram** of your **current site** and all of its features (e.g. faucet, trees, buildings, etc.) and its size. You may use a separate sheet if necessary.



(7b) Provide a **diagram** of your **site** with the **proposed OWLS features** (e.g. bird houses, butterfly and hummingbird gardens, pond, etc.) including the size of the area. You may use a separate sheet if necessary.



(8) Provide the **location(s)** of your **Wildlife Resources Center** where curriculum materials, equipment and references will be kept.

Library (Room 111) - Curricular materials and references
7th grade science lab (Room 275)

(9) **Site Use**: Provide a short narrative as to **who, how** and **when** the **site will be used.** Please include use by the community, clubs and organizations.

The Mountain Valley Outdoor Wildlife Learning Site will be used by Mountain Valley School students K-8 during the school day, and by community children and adults on weekends and summers on their own and in activities conducted by the Mountain Valley Recreation Department. Activities will be taken from Project WILD, Project WILD Aquatic, Project Learning Tree, and other hands-on curricular programs. Each K-8 student will participate in a minimum of two activities per semester.

(9b) Describe some of the **activities** to be conducted on the site by the school including multi-disciplinary use by the classes.

The Math sections will be measuring the DBH's of the trees in the area; the English sections will be reading Thoreau's works in the outdoor classroom; and the history sections will be re-enacting early pioneer life.

(10) **In-service Training.**

(a) Number of people trained in Project WILD 2
Have they used this training in the classroom? Yes

(b) Number of people trained in Project Learning Tree 3
Have they used this training in the classroom? No

(c) Plans for **future training:**
Project WILD training will be offered to all teachers as well as parents and other community members.

(11) **Site Development:** List the start and completion dates for each feature to be developed on your site in the calendar provided. Also list any publicity events, continuing work on alternate funding, in-service training and maintenance of the area.	
Fall of Year 1	Apply for OWLS grant Formed OWLS Committee Contacted other community resource people Assess site and involve students in planning
Winter of Year 1	Sent 5 people to PW workshops Contacted possible community funding sources Worked on draft of site plan
Spring of Year 1	OWLS areas laid out and marked off Students have candy sale to buy songbird bundles Songbird bundles planted in wooded area
Summer of Year 1	Receive OWLS and other funding Erect bird feeders
Fall of Year 2	Attend PW & PLT workshops Construct pond
Winter of Year 2	Learn about native vegetation Have local naturalist give talk
Spring of Year 2	Plant flowers and shrubs Arrange boulders, plant butterfly & hummingbird gardens
Summer of Year 2	Maintain areas already planted
Fall of Year 3	Plant park area trees
Winter of Year 3	Keep bird feeders full
Spring of Year 3	Turn in final report to the WVDNR by July 1

(12) **Budget**: Provide detailed budget worksheets indicating **current and/or pending support, in-kind services and local resources** from the OWLS program.

(12a) **Current/Pending Support**

Source	**Support**	**Amount**
Candy Sales	Wooden Area Songbird bundles (2)	 $24.00
Mountain Valley Jaycees	Park Area White pine (1-4') Red oak (2-8') Sycamore (1-10') Paw paw (1-6') Black walnut (1-8') Sugar maple (1-8')	 $49.98 $59.90 $39.95 $29.95 $39.98 $29.95
PTA	Meadow Planting Little bluestem (2 lbs.) Indian grass (2 lbs.) Native Wildflower seed mix (3 lbs.)	 $24.00 $24.00 $75.00
	TOTAL	**$396.71**

(12b) **In-kind Services** and **Local Resources**

Source	**Support**
Students Teachers Parents & Community Volunteers	Labor

(12c) **Requested OWLS Funds** (use additional pages, if necessary).

Feature	**Supplies**	**#**	**Price/Item**	**Total**
Pond	Tetra 32 mil. Liner (16' x 22' x 2')	1	$479.00	$ 479.00
	Sandstone waterfall & pond border	1.5t	$207.00/t	$ 310.50
	Pump (Little Giant 4E 34N)	1	$146.50	$ 146.50
	Cattail, bulrush, sedge	-	N/C	N/C
Hummingbird Garden	Limestone boulders	1t	$148.00/t	$ 148.00
	Tetra 32 mil liner for pool (4' x 9' x 2')	1	$ 99.00	$ 99.00
	Trumpet vine	6	$ 8.98/gal	$ 53.00
	Bee balm	5	$ 8.98/gal	$ 44.90
	Butterfly weed	5	$ 8.98/gal	$ 44.90
	Cardinal flower	5	$ 8.98/gal	$ 44.90
	Azalea	1 bush	$ 7.50	$ 7.50
	Seed packets	5	$ 4.98	$ 24.75
Butterfly Garden	Sandstone boulders	1t	$207.00/t	$ 207.00
	Tetra 32 mil liner for pool (4' x 9' x 2')	1	$ 99.00	$ 99.00
	Redbud trees	3-4'	$ 24.95	$ 74.85
	Lilac	4	$ 9.98/gal	$ 39.92
	Pink spirea	4	$ 9.98/gal	$ 39.92
	Seed packets	9	$ 4.95	$ 29.95
			TOTAL	$1,914.97

(13) Describe how the group plans on:

(a) **Involving** the **community**.

We will have work days open to parents and community volunteers.

(b) Gathering **publicity** for the area.

Any event on the site (work days, summer activities) will be advertised in our local newspaper and we will invite the media and community leaders to work days.

(14) List the **vegetation** to be planted in each area. Please include both common and scientific names. The OWLS program requires the use of primarily native plants. Use additional pages if necessary.

Pond
Cattail (*Typha latifolia*)
Bulrush (*Scirpus* spp.)
Sedge (*Carex* spp.)

Hummingbird Garden
Trumpet vine (*Campus radicans*)
Bee balm (*Monarda didyma*)
Butterfly weed (*Asclepias tuberosa*)
Cardinal flower (*Lobelia cardinalis*)
Azalea (*Rhododendron* spp.)
Seed packets: Wild columbine (*Aquilegia canadensis*), Larkspur (*Delphinium* spp.), Phlox (*Phlox* spp.), Petunia (*Ruellia* spp.).

Park Area
White pine (*Pinus strobus*)
Sycamore (*Plantanus occidentalis*)
Paw paw (*Asimina triloba*)
Black walnut (*Juglans nigra*)
Sugar maple (*Acer saccharum*)
Red oak (*Quercus rubra*)

Butterfly Garden
Redbud (*Cercis canadensis*)
Lilac (*Syringa vulgaris*)
Pink spirea (*Spirea* spp.)
Seed packets: Aster (*Aster* spp.), Butterfly weed (*Asclepias tuberosa*), Goldenrod (*Solidago* spp.), perennial daisies (*Chrysanthemum* spp.)

Meadow Planting
Little bluestem (*Andropogon gerardii*)
Indian grass (*Sorghastrum nutans*)
Wildflower seed mix: Aster (*Aster* spp.), Oswego tea or bee balm (*Monarda didyma*), Black-eyed susan (*Rudbeckia hirta*), Goldenrod (*Solidago* spp.), Shooting star (*Dodecatheon meadia*).

(15) Provide examples of **how** the group will **measure success** (e.g. student projects, use of the area by groups other than the school, number of nestlings hatched in bird boxes, etc.). A **final report**, including an evaluation of success and a financial accounting, is required by **July 1, of year three of the project** (See pg. 45 for details).

Each class, on a rotating schedule, will be required to put up a month long display on something they have learned about from our site. We hope to teach principles of general ecology and conservation through our area and these concepts will be reflected in the children's displays. Since this project needs to have a lot of school and community support, success will also be measured in the number of volunteers and participants willing to help on work days and throughout the year. As our area grows, we hope to see donations from the community as well as increased interest in our area making it available to other groups and schools in the area.

Please mail completed application by **November 1** to:

OWLS
Wildlife Diversity Program
WV DNR Wildlife Resources Section
P.O. Box 67
Elkins, WV 26241

DEVELOPING AN OWLS PLAN

When starting a project such as this, it's often hard to know what questions to ask. Here are some additional and common questions about OWLS:

Who should be responsible for planning, implementing, and maintaining the OWLS?

The OWLS Committee

Who should be on the OWLS Committee?

- a school administrator
- at least two teachers
- at least two students
- at least one person from the school maintenance staff
- at least two parents

A **WDP** biologist can provide ideas and guidance along with other area resource specialists, cooperators and prospective funding partners; however, the members of the OWLS Committee will do the majority of the work. The more local people you involve, the more likely your project will succeed, not only in the short term, but also in the long run. Experience has shown that projects developed by one or two people expire when those people leave. However, long-term committee involvement should take into consideration workable numbers in order to expedite business. Normally, committees should number more than eight but less than fifteen.

What are the responsibilities of the OWLS Committee?

- Y inventory teacher interest (involve all interested teachers)
- Y inventory the potential site(s)
- Y decide what features exist and should be maintained on the site
- Y decide what new features are feasible for the site (see the Wild Yards information on the WVDNR web page)
- Y decide where the features will be located
- Y make a map of the site with desired features (see Figure 7b, p. 23)
- Y determine the cost of development and maintenance
- Y prepare a budget (see budget, p. 26)
- Y publicize the project (to get community support and involvement)
- Y obtain funding (involve other prospective funders in the OWLS)
- Y decide who will be responsible for developing each of the features
- Y decide what equipment is needed for feature development
- Y decide who will be responsible for the maintenance of each of the features
- Y decide what equipment is needed for maintenance
- Y decide who will be selecting learning activities for each feature
- Y decide who will be responsible for the school Wildlife Resource Center (WRC)

- Y decide where the WRC will be located

OWLS Committee Responsibilities continued...

- Y decide what the WRC will contain
- Y decide what kind of in-service training is necessary for teachers
- Y decide that teachers should participate in training at least once per year
- Y decide how the in-service training is going to be funded
- Y re-evaluate the use of the site every year
- Y update programs, educational activities, and habitat improvements every year
- Y prepare and submit final report on time

What will be helpful for the inventory and site mapping?

aerial map & soil map [contact your local Natural Resources Conservation Service (NRCS) (formerly SCS) listed in the telephone book under U.S. Govt., USDA]
topographic map - U.S. Geological Survey (304) 594-2331
(Local bookstores and sporting goods stores sometimes carry topographic maps.)
plant identification book - local bookstore, nature centers, see references (page 44)
site map
a 100-foot tape measure

What should we include in our inventory?

- { topographic and geologic features (rocks, outcrops, boulders, slopes, streams, lakes, ponds, wetlands, etc.)
- { soil types (see your county soil survey book and ask your county NRCS District Conservationist to help with this)
- { soil profiles (stream cuts, road cuts, slopes, etc.)
- { plants (grasses, shrubs, trees, vines, flowers, harmful plants, old field vegetation for plant succession studies, etc.)
- { animal habitats (forests, forest openings, fields, wetlands, streams, riparian areas, spring seeps, brushy/shrubby areas, evergreens, brush piles, food plants, old stumps, fallen logs, snags (dead standing trees) and cavity trees (den trees), etc.)
- { historical remnants (fences, foundations, orchards, outbuildings, etc.)
- { surrounding landscape (agricultural, forested, suburban, urban, etc.)

SITE FEATURES

OWLS will vary in size and character as each will be tailored to the school grounds or area being considered. Each site should contain at least a planting of small trees and shrubs, a butterfly/hummingbird garden or a wet area as small as a frog pool up to a segment of a creek or even a larger marsh or pond. Each site may be customized to the available landscape and designed to achieve specific learning objectives. OWLS areas may range from a small plot of native shrubs with a small pool in a corner of the school yard to sites that feature several of the following possibilities:

feeding stations for birds, squirrels, etc.
shrubs that represent woody songbird plantings
food plots for wildlife (grains left unharvested)
butterfly and/or hummingbird gardens
nesting structures for songbirds and small mammals
water - a lined pond or developed wetland,
incorporating wetland plant species
woody plantings that include trees and shrubs
to be used as nesting cover, food and perching sites
a meadow
unmown area
perching wire
managed grassland
rock garden
brush piles - shelter
dead or fallen trees - homes
interpretive trails

Additional Considerations and Options:

- ∪ use native plants whenever possible
- ∪ incorporate feeding stations to bring wildlife into view where they can be identified, observed, counted and recorded; consider wildlife viewing blinds
- ∪ use bird and small mammal nesting boxes to observe behavior and reproductive activities
- ∪ utilize brush or rock piles to provide cover and nesting sites for wildlife
- ∪ use weather stations to help correlate weather to habitat conditions and animal behavior
- ∪ construct an area with animal tracks pressed into clay or cement to help students learn to find and identify tracks in the wild
- ∪ incorporate trails and interpretive signs to offer students a chance to learn about wildlife by preparing material (any printed material or signs must recognize the WDP as a funding source)
- ∪ consider time capsules to relate current wildlife issues to future students
- ∪ include teachers, administrators, maintenance staff, students, parents and community resource people in the planning, implementation and maintenance of the site and development of learning activities
- ∪ apply learning activities that are site-specific and encompass many disciplines, such as science, math, art, writing and social sciences
- ∪ incorporate concepts to reduce demands on water, soil, and other natural resources (ie recycling or composting) to help foster a strong conservation ethic
- ∪ utilize or modify site activities from programs such as PLT, PW, and Project Wet
- ∪ establish a Wildlife Resource Center (WRC) in the school to house other curricular

materials, field and lab equipments, texts, references, field guides, etc.

DEVELOPING SITE FEATURES

There are a number of site features that can be included in your OWLS area. This section discusses the following list of features:

Native Species
Meadow Plantings
Woodland Plantings
Butterfly Gardens
Hummingbird Gardens
Wetlands, Ponds & Pools
Bird & Squirrel Feeding Stations
Nesting Boxes
Trails & Signs
Time Capsules
Natural Succession Areas
Student Involvement in Planting

Native Species

Native species refer to wild animals and plants that have evolved to a particular region and environment. Non-native (exotic) species are introduced from other regions or countries, accidentally, intentionally or through habitat change induced by humans or nature. Often these exotic species have no natural predators in the area where they are released allowing their population to increase rapidly. Exotic species often out-compete native species for food, shelter or space. Many times the exotic species have become pests and have taken over 25% of the native plants in West Virginia.

Some Examples of Exotic Plants That Occur in West Virginia and should be avoided:

Johnson grass	multiflora rose	dandelions	white mulberry
ragweed	hawkweeds	sourgrass	winged euonymus
bedstraws	Japanese barberry	Japanese honeysuckle	
garlic mustard	paper mulberry	oriental bittersweet	crown vetch
leafy spurge	chickweeds	tree of heaven	stinging nettle
knapweed	English ivy	love grasses	bull thistle
mugwort	mimosa	spotted knapweed	Canada thistle
crabgrass	Siberian elm	purple loosestrife	chickory
kudzu	Fescue 31	Japanese knotweed	yellow bedstraw
Japanese smartweed	privet	autumn olive	

For a more detailed list of invasive and exotic plants that threaten West Virginia's natural areas, contact the OWLS Coordinator or P.J. Harmon, botanist [P.O. Box 67, Elkins, WV 26241, or (304) 637-0245].

Native Plants continued

Should you dig native plants if they are not available? OWLS recommends that you refrain from digging entire plants, but you can collect their seeds and plant them in your garden. However, if you really want a whole plant, try to find areas planned for development such as new road construction, housing developments or a proposed parking lot. Talk to the people in charge and get permission to dig plants before the area is bulldozed. Ask the highway department for information. This is an excellent way to obtain free native species.

Meadow Plantings

Often overlooked as wildlife habitat are open, grassy meadows. Grasses and forbs (wildflowers) provide food and nesting cover for many species of wildlife. Large meadows should include NATIVE forbs found within the local plant communities. Extremely small plots may only have room to accommodate grass species.

Ground Preparation -- The site should be tilled in the fall to kill cool season grasses, overwintered, tilled again in March and seeded shortly thereafter. Cover crop is an alternative to clean till seedbed preparation. Mulch spread after seeding and pressed into the soil will aid in establishment by increasing soil moisture and enhancing germination and plant survival.

Planting -- In addition to drilling, students may broadcast seed by hand. On large plots, this can be accomplished by assigning the students a grid or a line to walk. The surface can be dragged with a chain or raked to cover seeds. Uneven seeding may result, but this is an acceptable method and useful for showing succession and colonization. For comparison, a combination of drilling and hand seeding can be done. The choice to drill or hand seed will depend upon the size of the area and the speed at which the school wants the area covered. For small plantings, hand gathered seed may be more than adequate. In rural areas, parents, school board members, or others may be interested in being involved with site preparation by supplying and operating tilling equipment.

Seeding Mixture for Grasses

Big bluestem (*Andropogon gerardii*)
Little bluestem (*Andropogon scoparius*)
Switch grass (*Panicum virgatum*)
Indian grass (*Sorghastrum nutans*)
Sideoats grama (*Bouteloua curtipendula*)

Forbs -- Many of these are commercially available, especially if large meadows are to be planted. There are also "native wildflower" mixes available through nurseries and seed catalogs, however, be aware that many of the "native" species are not native to West Virginia.

More nurseries are specializing in native plants every year. Below are some nurseries that propagate and sell native plants, and some even offer installation services. The nurseries located in West Virginia are listed first. Out-of-state suppliers were selected for this list based on a these criteria: located within about 100 miles of WV, offer mail order or installation service, and have a high percentage of native plants in their stock. A percentage of native plant stock for each nursery is given at the end of each listing when known. *This list is not meant to be inclusive nor is it an endorsement by the WV Division of Natural Resources of any individuals or businesses.*

West Virginia Native Plant Suppliers

Use the following keys to choose the type of nursery plant materials, and services that you are looking for.
H=Herbaceous (may include annuals, perennials, ferns, grasses)
I= Offers installation services
MO=Mail Order
S=Seeds
SH=Shrubs
T=Trees
W=Wetland plants or aquatics

Enchanter's Garden
HC 77 Box 108
Hinton WV 25951
(304) 466-3154
MO, H, S, SH, T, W 99%

Native Garden Design
Josh Meadows or Trey Flemming
Rt. 2 Box 484
Salt Rock WV 25559
Day (304) 541-0184 Eves (304) 736-6219
I, SH 100%

Spaulding Landscaping and Homeview Farm
Rt. 1 Box 39
Sheperdstown, WV 25443
(304) 876-2096
Email: homeviewfarm@aol.com
H, I, SH, T 15%

Sunshine Farm & Gardens
HC 67 Box 539B
Renick, WV 24966
(304) 497-2208
www.gardenweb.com/sunshine
H, SH, T, W 50%

Virginia Provenzano
Landscape Design & Garden
420 Dam # 4 Rd.
Sheperdstown, WV 25443
(304) 267-6924
Email: provenzano4@earthlink.net
MO, SH, T 100%

West Virginia Division of Forestry
Clements State Tree Nursery
PO Box 8
West Columbia, WV 25287
(304) 675-1820

Out-of- State Suppliers

Atlantic Star
620 Pyle Rd.
Forest Hill, MD 27050
(470) 838-7950
atlantic@iximd.com

Appalachian Nurseries, Inc
PO Box 87
Waynesboro, PA 17268
(717) 762-4733, FAX (717) 762-7532
SH, T

Bowman's Hill Wildflower Preserve
PO Box 685
New Hope, PA 18938
(215) 862-2924 FAX (215) 862-1846
www.bhwp.org/native
MO, S 100%

Doyle Farm Nursery
158 Norris Road
Delta, PA 17314
(717) 862-3134
MO, H, 75%

England's Herb Farm
33 Todd Rd.
Honey Brook, PA
(610) 273-2863, FAX (610) 273-2556
I, MO, H, W 80%

Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA 16335
(800) 873-3321, FAX (814) 336-5191
www.ernstseed.com
I, MO, H, S, SH, T 75%

Environmental Concern
PO Box P,
St. Michaels, MD 21663
(410) 745-9620, FAX (410) 745-3517
www.wetland.org
SH, T, W 100%

Flickinger's Nursery
PO Box 245
Sagamore, PA 16250
(800) 368-7381, FAX (724) 783-6528
MO, T, SH, H

Gary's Perennials
1122 E. Welsh Road
Maple Glen, PA 19002
(800) 898-6653, FAX (215) 628-0216
MO, H, W 20%

Heirloom Seeds
PO Box 245
W. Elizabeth, PA 15088
(412) 384-0852, FAX (412) 384-0852
www.heirloomseeds.com
MO, S, 80%

Lower Marlboro Nursery
PO Box 1013
Dunkirk, MD 20754
(301) 812-0808 FAX (301) 812-0808
Email: mssd@erols.com
MO, T, SH, H, W 80%

Land Reforms Nursery & Landscape
35703 Loop Rd.
Rutland, OH 45775
(740) 742-3478
I, MO, H, T, S, SH, W 90%

Maryland Natives Nursery
9120 Hines Rd.
Baltimore, MD 21234
(410) 529-0552 FAX (410) 529-3883
I, H, SH, W 95%

Mary's Plant Farm and Landscape
2410 Lanes Mill Road
Hamilton, OH 45013
(513) 894-0022 FAX (513) 892-2053
MO, T, SH, H 25%

Shooting Star Nursery
444 Bates Rd.
Frankfort, KY
(502) 223-1679, FAX (502) 875-2231
MO, H, S, SH, T, W 100%

Virginia Natives
PO Box D
Hume, VA 22639
(540) 364-1665 Phone & FAX
Email: vanatvs@erols.com
MO, H, SH, T, W 50%

Wetland Supply Co./Native Plant Nursery
1633 Gilmar Rd.
Apollo, PA 15613
(724) 327-1830, FAX: (724) 733-3527
I, MO, H, SH, S, T, W 99%

Other Information:
West Virginia Native Plant Society – Information
Bill Grafton
345 West Virginia Avenue
Morgantown, WV 26501
(304) 293-4797 X2493

There are two great sources of native plant information including, photographs of plants native to your area and suppliers nationwide are the Lady Bird Johnson Wildflower Center website at www.wildflower.org and U.S. Department of Agriculture at http://plants.usda.gov/

Native or Adventive Species of Plants for Moist/Shaded Areas

Jack-in-the-pulpit (*Arisaema triphyllum*)
Wild ginger (*Asarum canadense*)
Blue false indigo (*Baptisia australis*)
Buttonbush (*Cephalanthus occidentalis*)
Wild geranium (*Geranium maculatum*)
Winterberry (*Ilex verticillata*)
Cardinal flower (*Lobelia cardinalis*)
Great blue lobelia (*Lobelia siphilitica*)
Smooth azalea (*Rhododendron arborescens*)
Flame azalea(*Rhododendron calendulaceum*)
Purple laurel (*Rhododendron catawbiense*)
Pinxter flower (*Rhododendron niduflorum*)
Rhododendron (*Rhododendron maximum*)
Ward's willow (*Salix caroliniana*)
Glaucous willow (*Salix discolor*)
Sandbar willow (*Sal;ix interior*)
Shining willow (*Salix lucida*)
Heartleaf willow (*Salix rigida*)
Silky willow (*Salix sericea*)
Virginia saxifrage (*Saxifraga virginiensis*)
Spiraea (*Spiraea alba*)
Foamflower (*Tiarella cordifolia*)
Oswego tea (*Monarda didyma*)

Native or Adventive Species of Plants for Dryer Sites

Yarrow (*Achillea millefolium*)
Milkweed (*Asclepias* spp.)
Butterfly weed (*Asclepias tuberosa*)
New England aster (*Aster novae-angliae*)
Partridge pea (*Cassia fasciculata*)
Climbing bittersweet (*Celastrus scandens*)
Shooting star (*Dodecatheon meadia*)
Dragon head (*Dracocephalum virginianum*)
Western sunflower (*Helianthus occidentalis*)
Rough blazing star (*Liatris aspera*)
Spiked lobelia (*Lobelia spicata*)
Wild bergamont (*Monarda fistulosa*)
Evening primrose (*Oenothera argillicola*)
Black-eyed susan (*Rudbeckia hirta*)
Three-lobed coneflower (*Rudbeckia triloba*)
Fire pink (*Silene virginica*)
Oldfield goldenrod (*Solidago nemoralis*)

Woodland Plantings

NATIVE trees are part of the West Virginia natural heritage. They should be used *whenever* possible to illustrate the kinds of species adapted to the woodland biomes found within the State. Tree and shrub plantings should include those native to West Virginia that have adapted to the soils and climates of the habitat site. They enhance sites by providing habitat, nesting cover and food for wildlife, both vertebrates and invertebrates.

Ground Preparation -- If large stands or rows of trees are planned, the ground should be tilled in September or October, overwintered, and tilled again in the spring.

Planting -- In many cases, except as required by boundaries and property fences, straight rows should be avoided and curved rows used instead. More importantly, random arrangements should be encouraged. Flags where holes will be dug can be placed by walking a straight line, but randomly setting flags on either side at varying distances. Straight lines are further avoided if students dig the holes! Clumping vegetation works well, especially for shrubs, and allows succession to occur and expand in open areas.

Trees Species	Height	Wildlife Value
Red maple (*Acer rubrum*)	50-70'	squirrels, chipmunk, evening grosbeak
Sugar maple (*Acer saccharum*)	60-100'	same as above
Ashleaf maple (*Acer negundo*)	75'	same as above
Pawpaw (*Asimina triloba*)	30'	
Shagbark hickory (*Carya ovata*)	70-100'	
Hackberry (*Celtis occidentalis*)	50-90'	
Common persimmon (*Diospyros virginiana*)	20-70'	
American beech (*Fagus grandifolia*)	60-80'	
White ash (*Fraxinus americana*)	70-80'	
Butternut (white walnut) (*Juglans cinera*)	40-70'	
Black walnut (*Juglans nigra*)	70-90'	
Eastern red cedar (*Juniperus virginiana*)	10-25'	
Mt. Laurel (*Kalmia latifolia*)	20'	
Red spruce (*Picea rubens*)	60-70'	
White pine (*Pinus strobus*)	70-100'	great importance: especially favored by nuthatches, jays: also fur and game mammals, hoofed browsers; also used for nesting and roosting cover
Pin Oak (Quercus palustris)	70-90'	great importance: especially favored by gamebirds and songbirds; also used by many mammals and hoofed browsers
White oak (*Quercus alba*)	80-100	same as above
Sycamore (*Plantanus occidentalis*)	60-100'	
Black cherry (*Prunus serotina*)	60-80'	numerous songbirds and gamebirds, small and large mammals

Scarlet oak (*Quercus coccinea*)	60-80'	same as above
Red oak (*Quercus. rubra*)	60-90'	same as above
Black willow (*Salix nigra*)	30-60'	
Eastern hemlock (*Tsuga canadensis*)	60-70'	favored by pine siskin, chickadees, grouse, squirrels, used for winter cover by ruffed grouse, wild turkey, deer, used for nesting by various warblers, junco.
Blackhaw (*Viburnum prunifolium*)	20'	

Shrubs and Small Trees	Height	Wildlife Value
Common serviceberry (*Amelanchier arborea*)	25'	
American redbud (*Cercis canadensis*)	10-20'	
Alternate-leaf dogwood (*Cornus alternifolia*)	25'	
Flowering dogwood (*Cornus florida*)	30'	Favored by songbirds and gamebirds; used for browse by large and small mammals
American hazelnut (*Corylus americana*)	3-6'	same as above
Witch hazel (*Hamamelis virginiana*)	20-30'	
American holly (*Ilex opaca*)	40-70'	songbirds
American plum (*Prunus americana*)	6-12'	
Choke cherry (*Prunus virginiana*)	6-10'	
Rhododendron (*Rhododendron maximum*)	20'	
Blackhaw (*Viburnum prunifolium*)	20'	

Pipevine (*Aristolochia macrophylla*)	Black elderberry (*Sambucus canadensis*)
Scarlet trumpet vine (*Campsis radicans*)	Red elderberry (*Sambucus pubens*)
Climbing bittersweet (*Celastrus scandens*)	Greenbrier (*Smilax rotundifolia*)
Virgin's Bower clematis (*Clematis virginiana*)	Bittersweet (*Solanum dulcamara*)

Additional Shrubs and Vines:

Virginia creeper (*Parthenocissus quinquefolia*)	Blueberry (*Vaccinium* spp.)
Wild crabapple (*Pyrus coronaria*)	American grape (*Vitis* spp.)
Wild black currant (*Ribes americanum*)	Summer grape (*Vitis aestivalis*)

Butterfly Gardens

Butterflies are attracted to flowers either as nectar sources or because they are host plants for egg laying and food. Certain wildflowers, cultivated flowers, trees, shrubs and vines are particularly attractive nectar sources and should make up most of the butterfly feature planting. A drinking source can be made by using a shallow pool of water with sloping sides or a series of partially submerged flat rocks for perches.

Shrubs, Trees and Vines that Attract Butterflies

Ohio or Fetid buckeye (*Aesculus glabus*)
Paw Paw (*Asimina triloba*)
New Jersey tea (*Ceanothus americanus*)
Buttonbush (*Cephalanthus occidentalis*)
Redbud (*Cercis canadensis*)
Clematis (*Clematis* spp.)
Hawthorn (*Crataegus* spp.)
Huckleberry (*Gaylussacia* spp.)
Privet (*Ligustrum* spp.)
Spicebush (*Lindera benzoin*)
Wild plum (*Prunus americana*)

Pear (*Pyrus communis*)
Wild crab apple (*Pyrus coronaria*)
Fragrant sumac (*Rhus aromatica*)
Smooth sumac (*Rhus copallina*)
Wild gooseberry (*Ribes americanum*)
Dewberry (*Rubus* spp.)
Spirea (*Spiraea* spp.)
Lilac (*Syringa* spp.)
Blueberry (*Vaccinium* spp.)
Blackhaw (*Viburnum prunifolium*)
Dutchman's Pipe (*Aristolochia macrophylla*)

Forbs that Attract Butterflies

Yarrow (*Achillea millefolium*)
Dogbane (*Apocynum* spp.)
Butterfly weed (*Asclepias tuberosa*)
Aster (*Aster* spp.)
Perennial daisies (*Bellis perennis*)
New Jersey tea (*Ceanothus americanus*)
Wild Bergamot (*Monarda fistulosa*)
Ironweed (*Veronia noveboracensis*)
Goldenrod (*Solidago* spp.)
Joe-pye weed (*Eupatorium maculatum*)
Blazing star (*Liatris* spp.)
Milkweeds (*Asclepias spp.*)
Cardinal flower (*Lobelia cardinalis*)
Mint (*Mentha arvensis*)
Marigolds (*Targetes* spp.)
Red clover (*Trifolium pratense*)
Zinnia (*Zinnia elegans*)

Hummingbird Gardens

Hummingbirds can be attracted to your area by planting red, tubular flowers. Over 160 native North American plants depend exclusively on hummingbirds for pollination. Here is a list of plants most attractive to hummingbirds.

Forbs, Vines, Shrubs and Trees that Attract Hummingbirds

Buckeye (*Aesculus* spp.)
Columbine (*Aquilegia canadensis*)
Milkweed (*Asclepias* spp.)
Cross Vine (*Bigonia capreolata*)
Trumpet creeper (*Campsis radicans*)
New Jersey tea (*Ceanothus americanus*)
Redbud (*Cercis canadensis*)
Thistle (*Cirsium* spp.)
Clematis (*Clematis* spp.)
Canada Lily (*Lilium canadense*
Yellow poplar (*Liriodendron tulipifera*)
Cardinal flower (*Lobelia cardinalis*)
Mallow (*Malva* spp.)
Bee balm (*Monarda didyma*)
Bergamot (*Monarda fistulosa*)
Evening primrose (*Oenothera* spp.)
Phlox (*Phlox* spp.)
Morning glory (*Ipomoea coccinea*)

Larkspur (*Delphinium* spp.)
Geraniums (*Geranium* spp.)
Touch-Me-Not (*Impatiens capensis*)
Pale Touch-Me-Not (*Impatiens pallida*)
Blazing stars (*Liatris* spp.)
Azalea (*Rhododendron* spp.)
Black locust (*Robinia pseudo-acacia*)
Fire pink (*Silene virginica*)
Coralberry (*Symphoricarpos orbiculatus*)
Old-Fashioned Weigela (*Weigela florida*)

Hummingbird Feeders -- As a supplementary source of food, hummingbird feeders can be hung in your OWLS area. Select feeders that can be taken apart and cleaned thoroughly to prevent fungus molds and bacteria. Fill your feeders with a boiled solution of **4 parts water to 1 part white refined sugar** or a commercial "nectar" mix. Any sweeter and the birds may develop kidney or liver damage. To blend the solution sufficiently, bring water to a full boil, add sugar, stir to dissolve and remove promptly from heat. Do not overboil and allow the solution to cool, storing unused portions in the refrigerator. Do not use honey solutions in feeders as they may produce a fungal disease fatal to hummingbirds. Sugar water feeders should be cleaned every 3 to 5 days using hot water and a little vinegar, not soap.

Since the safety of "food colorings" is in question, particularly red dyes, do not use red food coloring in your solution. Avoid commercial solutions with red coloring also. It is not necessary to use red food coloring because most feeders already have red flowers or some form of red color decoration that will attract hummingbirds.

Wetlands, Ponds and Pools

Watering areas will enhance wildlife visitation to any size site. Water sources may range from small submerged basins and large tanks associated with feeding stations, to a pond or wetland on a large site. In addition to providing drinking water, a large tank may attract dragonflies and amphibians. Aquatic sites may be used by waterfowl and shorebirds. Goose nesting structures and wood duck nesting boxes can be installed in many sites. However, be aware that geese become aggressive when the young hatch and the droppings may be a problem.

Activities for artificial ponds may include introductions of frogs, salamanders, insect larvae, plants or fish. Given the opportunity, students can be relied upon to collect many animals for the pond themselves. Be sure they are from local sources. Amphibian and insect metamorphosis may be observed from stocked tadpoles and dragonfly larvae. Energy flow and nutrient (fertilization) effects can be compared among ponds or tanks if several have been included.

Aquatic & Marsh Plants

Sedges (*Carex* spp.)
Barnyard grass (*Echinochloa crusgalli*)
Spikerush (*Eleocharis spp.*)
Rushes (*Juncus* or *Scirpus* spp.)
Duckweed (*Lemna* spp.)
Smartweed (*Polygonum pensylvanicum*)
Tearthumb (*Polygonum sagittatum*)
Pondweed (*Potamogeton* spp.)

Bird and Squirrel Feeding Stations

Even school yards with severely limited space have areas where feeding stations can be integrated. Feeders are an excellent way to bring birds and squirrels into view and involve students with wildlife by visual contact. Feeding stations can be incorporated into new learning sites on the school grounds or into existing shrubs and trees near the building.

An effective way to maintain a feeder is to have it adopted by a classroom or a grade. Depending on the number of feeders, a classroom may maintain the entire station or a single feeder, or feeder filling may be rotated among grades or classrooms.

Nesting Boxes

Numerous bird house designs are available to accommodate many different species. Above and below ground nesting boxes can also be made for native mice.

When possible, students should be involved in building feeders and nest boxes. Schools and teachers may wish to have industrial arts classes make these materials in order to add to the educational value of the entire project. Bird house plans are available from the WPD.

Trails and Signs

Trails should be designed in large or dense sites. Trails through tall grass can be made by regularly mowing a single path. If interpretive signs are used for the site, students should be given a chance to research the signs. Signs would not have to be permanent, but could be an annual writing project for one or more grades. Either numbered posts with a brochure or laminated paper signs work fine.

Project ideas can range from older students writing a trail for younger students to younger students writing a trail for volunteer grandparents. Signs can simply be a title or a title with two sentences to two paragraphs, depending on the grade of the authors. Permanent signs are also an option, depending on the desires of the school and the expected use of the site by non-students. Any signs, interpretive stations, or printed materials should acknowledge the WDP as a funding source.

Time Capsules

A time capsule can add a dimension to an OWLS site. Considerations for inclusion include students' names who helped develop the site, newspaper articles covering wildlife and environmental issues at the time the OWLS was developed, and articles or materials found in the original area. Hand-recorded tapes of site sounds, photographs, and anything environmentally and student related are candidates. To improve the chances that a buried time capsule will not be forgotten or lost, it may be placed beneath the OWLS area designation sign or other fairly permanent marker. Time capsule recovery dates may be in periods of tens of years or every five years for grade schools. There could be as many as five buried capsules, which would allow for sixth grade classes to recover a capsule they buried as first graders. In the same hole, a new capsule of yet another first grade class is placed.

Natural Succession Areas

Both demonstration plots and large areas can be disturbed and left to be recolonized by surrounding species to show which kinds take hold first. This is a dynamic way to examine why windborne seed species are the first to colonize an area, to be followed by slower species relying on animal ingestion, body adhesion and gravity. The interplay of soil shading, changing Ph, modes of reproduction and minimum annual precipitation in determining the climax community of a disturbed area are also illustrated here. Since the process requires a period of years, teachers should periodically photograph the site from a standard position and record changes.

Student Involvement in Planting

In all cases, students and teachers should be involved in the planting process. Trees and shrubs lend themselves to this well. Without question, students from fifth grade on up can dig, plant and fill bare root stock and ball and burlap trees. First graders can do everything after the hole is dug for bare root stock, but need more supervision with ball and burlap and its deeper holes. In all cases, teams and the buddy system work best for trading off on digging, filling, tamping and carrying water .

Discussion beforehand should inform students 1) where trees grow and why; 2) how wildlife use trees for food and shelter and the importance of using native and non-invasive plants; 3) the species being planted; 4) how to plant these trees; 5) why it is important to tamp soil to remove air pockets and other reasons for procedures being used; and 6) what the trees will look like in the future.

Students can grow forbs in milk cartons or used styrofoam cups and transplant the species in grassy plots or special areas such as butterfly or hummingbird gardens. Other possibilities include hand scattering of forb seed in the grassy site or selecting an edge to be predominantly forbs. In such an edge, forb species can be easily found for identification. Such a concentration of flowers and seeds available for birds, small mammals and insects will attract attention as species come into bloom. Flower planting is an activity that can be done annually. As discussed previously for grass planting, students may be involved in ground preparation and seeding. Uneven seeding is acceptable and useful for showing succession and colonization. For comparison, a combination of drilling and hand seeding in different areas can be used. The choice will depend in part upon the speed at which the school wants the area covered. In rural areas, parents and board members may be interested in being involved with site preparation by supplying tilling equipment.

For more ideas on site development please see the West Virginia Wild Yards booklet available from the WDP. To obtain a free copy of the booklet please contact:

OWLS Grant Coordinator, West Virginia Division of Natural Resources
Wildlife Diversity Program, P.O. Box 67
Elkins, WV 26241
Or call (304)637-0245

THE SCHOOL WILDLIFE RESOURCE CENTER

A Wildlife Resource Center (WRC) should be established somewhere in the school. This should house curricular materials, field equipment, lab equipment, texts, references, etc. The following is a list of books and materials that might be included in your WRC. In order to acquire Project Wild (PW) and Project Learning Tree (PLT) curricular materials you must participate in their workshops. These, in fact, are outstanding experiences and we highly recommend that you participate in them. See page 46 of this manual for names of program contact persons. The Wildlife Resources Section has a collection of audiovisual materials that may be checked out. For a brochure write:

Wildlife Resources Section
Capitol Complex, Building 3
1900 Kanawha Blvd., East
Charleston, WV 25305
or call (304) 558-2771

Curricular Materials

Project WILD, see Appendix A, p. 52
Project Learning Tree, see Appendix A, p. 52
Project Underground, National Speleological Society
Hands on Nature, Vermont Institute of Natural Science
The Young Naturalist, Usborne Guide, Andrew W. Mitchell
The Berenstein Bears Nature Guide, Stan and Jan Berenstein
The Backyard Naturalist, National Wildlife Federation, Craig Tufts
Naturescope, National Wildlife Federation
Tips & Tricks in Outdoor Education, Malcom Swan
Sharing Nature with Children, Joseph Cornell
Eyewitness Books, Alfred A. Knopf
Field Guides

Equipment

Magnifying glasses	Butterfly nets	Sweep nets
Binoculars	Dip nets	Soil analysis kits
Microscopes	Water analysis kits	String & stakes for transects
Cameras		

Outdoor Wildlife Learning Sites (OWLS) Program Final Report

Deadline for schools that submitted grants in November of year 1 is July 1, of year 3.

Final Report Contents

(1) Report text:

Items to include in report —

Title of Project

Details:

- ⊃ Name, address and phone number of school and project director

Goals as stated in proposal

- ⊃ Did you meet your initial goals?

Body of report (examples of information to include):

- ⊃ What did you do?
- ⊃ Who helped with the work?
- ⊃ Who donated supplies, equipment, etc.?
- ⊃ How did you interest students, teachers, parents?
- ⊃ Any problems with work days, vandalism, lack of interest?
- ⊃ What did you learn?
- ⊃ What would you have done differently?
- ⊃ Did you have to adjust your original plan much and why?
- ⊃ What are your future plans?
- ⊃ How will you keep the enthusiasm high?

Any suggestions for improvement in the OWLS program as a whole:

- ⊃ Was there any confusion associated with the OWLS booklet?
- ⊃ Did you require more help than was provided by DNR staff?
- ⊃ Any suggestions to improve the OWLS program would be appreciated.

(2) Pictures and Publicity:

A pictorial account, such as a scrapbook, is very helpful and important for the continuation of this program. Please provide pictures or slides of:

- the various features of your site
- any workdays you had
- reproductions of media events such a newspaper clippings, spots on your local radio or TV station etc.
- any activities conducted on site
- a copy of any written material you generated such as booklets, trail guides, or pamphlets. **Any published material must acknowledge the WDP as a sponsor.**

(3) Financial information:

1) Documentation of accounts payable in the form of receipts, invoices and checks;

2) Financial statement listing actual expenditures with zero balance or unspent monies to be refunded to the WV DNR.

These accounting practices are necessary because all projects funded by the Wildlife Diversity Program are subject to a state audit.

Questions with Final Report? Contact the OWLS Grant Coordinator
office (304) 637-0245 fax (304) 637-0250

RESOURCES & REFERENCES

Resource personnel and printed materials are available to help in the planning and development of Outdoor Wildlife Learning Sites. Trained resource persons can be contacted at the WDP**,** your local Natural Resources Conservation Service office (formerly known as Soil Conservation Service), County Conservation District, Division of Forestry, Division of Environmental Protection, NRCS, US Forest Service, US Fish and Wildlife Service, US Geologic Survey, National Park Service, State Park Naturalists and/or County Cooperative Extension Office depending which agencies might be available in your area. Other places to find resource personnel are University faculty, local Garden Clubs, and Master Gardeners.

District biologists may also be available to help. Districts 1, 2 and 4 have Nongame District Biologists especially suited to assisting schools with their OWLS projects.

District 1-- Fairmont (304) 367-2720
District 2 -- Romney (304) 822-3551
District 3 -- French Creek (304) 924-6211
District 4 -- Beckley (304) 256-6947
District 5 -- Pt. Pleasant (304) 675-0871
District 6 -- Parkersburg (304) 420-4550

The WDP also produces a free quarterly full color magazine which is available online www.WVDNR.gov or by contacting the WV DNR at PO Box 67, Elkins WV, 26241 and requesting to be placed on the mailing list for **West Virginia Wildlife Magazine**.

Printed Materials & References

Adams, G. 1994. Birdscaping Your Garden; A Practical Guide to Backyard Birds and the Plants That Attract Them. Rodale Press, Emmaus, PA.

Adams, L. W. 1994. Urban Wildlife Habitats. University of Minnesota Press. Minneapolis, MN.

Allen, T. 1997. The Butterflies of West Virginia and Their Caterpillars. University of Pittsburgh Press. Pittsburgh, PA.
A free copy was sent to middle, junior, high schools and local libraries. If your school does not have a copy, contact the WDP.

Audubon Field Guide Series.

Buckelew, J. and G. Hall. 1994. West Virginia Breeding Bird Atlas. University of Pittsburgh Press, Pittsburgh, PA.
A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP.

Cronin-Jones, Linda. 1992. The Schoolyard Wildlife Activity Guide. Nongame Wildlife Program, Florida Game and Fresh Water Fish Commission.

Druse, K. and M. Roach. 1994. The Natural Habitat Garden. Clarkson Potter/ Publishers. New York.

Duda, M.D. 1995. Watching Wildlife. Falcon Press Publishing Co, Helena, MT.
A free copy was sent to middle, junior, high school and local libraries. If your school does not have a coy, contact the WDP.

Duda, M.D. 1999. West Virginia Wildlife Viewing Guide. Falcon Press Publishing Co., Helena, MT.

Field Guide to the Birds of North America. National Geographic Society.

Gazlay, S. 1998. Field Detectives Investigating Playground Habitats (Grades 3-6). AIMS Education Foundation, Fresno, CA.

Gertz, L.N. 1993. Let Nature be the Teacher; Seasonal Natural History Activities for Parents and Other Educators to Share with Young Children. Habitat Institute for the Environment. Belmont, Mass.

Golden Field Guide Series.

Green, N.B. and T.K. Pauley. 1987. Amphibians and Reptiles in West Virginia. University of Pittsburgh Press, Pittsburgh, PA.
A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP.

Guidelines and features for outdoor classrooms. Indiana Department of Natural Resources, Division of Forestry, Indianapolis, IN (317) 232-4105 (about $2).

Hall, G. 1983. West Virginia Birds. Carnegie Museum of Natural History. Special Publication No. 7.
A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP.

Jezerinac, R. F., G.W. Stocker and D.C. Tarter. 1995. The Crayfishes of West Virginia. Ohio Biological Survey, Columbus, OH.

Kaufman, G.A. and D.W. Kaufman. 1989. An Artificial Burrow for the Study of Natural Populations of Small Mammals. Journal of Mammology 70(3):656-659.

Laun, C. 1990. The Natural History Guide. Alsace Books, Columbia, MO.

Laun, C. 1990. Handbook of Nature and Scientific Photography. Alsace Books, Columbia, MO.

Leopold. 1949. A Sand County Almanac. Ballantine Books, New York, NY.

Merilees, B. 1989. Attracting Backyard Wildlife. Voyageur Press, Stillwater, MN.

Merritt. 1987. Guide to the Mammals of Pennsylvania. University of Pittsburgh Press, Pittsburgh, PA.

Milord, S. 1989. The Kids' Nature Book. Williamson Publishing, Charlotte, VT.

Minnesota Department of Natural Resources, Nongame Wildlife Program, Section of Wildlife, St. Paul, MN 55155: (highly recommended publications)
- Landscaping for wildlife (about $10)
- Wild About Birds; the DNR Bird Feeding Guide (about $20)
- Woodworking for Wildlife (about $10)

Natural Resources Conservation Service/County Conservation District:
- Invite Birds to Your Home
- Ponds: Planning, Design, Construction

Peterson Field Guide Series.

Schneck, M. 1990. Butterflies: How to Identify and Attract Them to Your Garden.

Shalaway. 1990. The Wild Side. Saddle Ridge Press, Cameron, WV.

Shalaway. 1992. Birds, Bats, Butterflies and Other Backyard Beasts. Saddle Ridge Press, Cameron, WV.

Shedd, W. 1994. The Kids' Wildlife Book; Exploring Animal Worlds Through Indoor/Outdoor Experiences. Williamson Publishing, Charlotte, VT.

Smith, J.L. 1996. Birds of the Kanawah Valley. Hanlan Chapter, Brooks Bird Club. Charleston, WV.

So You Want to Start an Outdoor Classroom? The Oklahoma Department of Wildlife Conservation, Oklahoma City, OK (405) 521-4633 (about $2).

Stauffer, J. R., J. M. Boltz and L. R. White. 1995. The Fishes of West Virginia. Academy of Natural Sciences of Philadelphia.

Strausbaugh and Core. 1970. Flora of West Virginia. Seneca Books, Inc., Morgantown, WV.

Swan, Malcom D. (Editor). 1983. Tips and Tricks in Outdoor Education; Approaches to Providing Children with Educational Experiences in the Outdoors. Interstate Printers and Publishers, Inc. Danville, Ill.

Tekulsky, M. 1985. The Butterfly Garden. The Harvard Common Press. Boston, Mass.

Trapp, S., M Gross, and R., Zimmerman. Signs, Trails, and Wayside Exhibits. UW-SP Foundation Press, Inc. University of Wisconsin Stevens Point.

Tufts, C. 1993. The Backyard Naturalist. The National Wildlife Federation. Washington D.C.

Tufts, C. and P. Loewer. 1995. Gardening for Wildlife. Rodale Press, Emmaus, PA.

Wilcox, J.A. 1972. Entomology Projects for Elementary and Secondary Schools. New York State Museum and Science Service Bulletin 422.

WV Wildlife Diversity Program, Elkins, WV:
- Attracting Cavity Nesting Birds to Your Backyard
- Bats of West Virginia
- Bluebird Box Construction and Placement
- Butterfly Gardening in West Virginia
- For the Birds ... Feeding Birds in Your Backyard
- Get Started Birdwatching

- Invasive Plants in West Virginia
- Mushrooms & Other Fungi of West Virginia
- Strictly for the Feathered
- WV Bird Checklist
- WV Butterfly Checklist
- WV Toads & Frogs
- WV Turtles & Lizards
- WV Mammal Checklist
- WV Neotropical Migratory Birds
- WV Reptile and Amphibian Checklist

West Virginia University Extension Wildlife Program, WVU, Morgantown, WV (304) 293-3391:

- Aquatic and Wetland Plants of West Virginia
- Guide to Common Birds of West Virginia
- Guide to Winter Botany
- Introduction to Dragonflies and Damselflies of West Virginia
- Introduction to Ferns of West Virginia
- Owls
- West Virginia Hawks
- West Virginia Wildlife
- Winter Birds of West Virginia

Web Resources

Exotics-both have links to other good pages

www.nbii.gov/invasive/
http://invasives.fws.gov

Curricula, Ideas, and Programs- many have links so look around.

www.usgs.gov/education
www.kn.pacbell.com/cgi-bin/listApps.pl?science&Tutorial
www.nwf.org/kids
www.nwf.org/nwf/education
www.nwf.org/wildlifework
http://www.sciencenetlinks.com/matrix.cfm
www.suite101.com
www.globe.gov.fsl/html
www.kidsgardening.com
www.enature.com
http://hprtec.org
www.nbii.gov/education
www.birds.cornell.edu/programs/education/index.html
http://eelink.net/ee-linkintroduction.html

Ideas of where to find other funding

www.epa.gov/enviroed/grants.html
http://eelink.net/grants-generalinformation.html
www.kidsgardening.com/grants.asp

Landscaping Resources on the web

www.dnr.state.oh.us/publications/wildflowers3.htm
http://plants.usda.gov/
www.kidsgardening.com/
www.for-wild.org/
http://aggie-horticulture.tamu.edu/kindergarden/Child/Cgintro.htm
www.wildflower.org

Videos

Planning Outdoor Classrooms, Trails and Recreation Areas -- Computer simulated plans for two outdoor classrooms, a fitness/nature trail, and a landscape plan for a community park pond. A good resource in helping schools plan and develop Outdoor Wildlife Learning Sites (OWLS). Produced by the USDA Soil Conservation Service, Salina, KS. 25:30 minutes long.

To check out a copy of this video, write:

Reference Center
Kansas Department of Wildlife and Parks
512 SE 25th Ave.
Pratt, KS 67124
(316) 672-5911 ext. 209

School Yard Habitat Video -- Another video that shows school sites already in existence is a video available from the WDP. The video is 16:00 minutes long. To check out a copy of the video, write:

School Yard Habitat Video
WDP WVDNR
P.O. Box 67
Elkins, WV 26241
(304) 637-0245

APPENDIX A

LEARNING ACTIVITIES AND READINGS RELATED TO OWLS

In-service training is the most effective way to help teachers utilize Outdoor Wildlife Learning Sites. In-services can be conducted by Project WILD (PW) facilitators or Project Learning Tree (PLT) facilitators and through workshops offered by colleges and universities throughout the state. This training provides increased communication and cooperation among these various groups, which have common goals.

The following are activities (A) and enrichment readings (R) that elementary and secondary teachers can use to involve students in their school OWLS. These activities and readings come from Project WILD (PW) and Project Learning Tree (PLT).

For more information on PW training contact: Project WILD, Wildlife Resources Section, Building 3, Capitol Complex, 1900 Kanawha Blvd., East, Charleston, WV 25305; phone 304/558-2771.

For more information on PLT training, contact: Leslie Fitzwater, or WV Forestry Assoc., P.O. Box 488, Ravenswood, WV 26164; phone (304) 558-2788.

Elementary

PW/A	The Hunter
PW/A	Wildlife in National Symbols
PW/A	What's That, Habitat?
PW/A	Beautiful Basics
PW/A	Animal Charades
PW/A	Adaptation Artistry
PW/A	Shrinking Habitat
PW/A	Improving Wildlife Habitat in the Community

PW	- Project Wild	**A**	- Activities
PLT	- Project Learning Tree	**R**	- Readings

Woodland Activities

PW/A	My Kingdom for a Shelter
PW/A	Thicket Game
PW/A	Forest in a Jar
PW/A	Everybody Needs a Home
PW/A	Some Forest Investigations
PW/A	Adopt a Tree
PLT/A	Tree Shapes, Natural and Unnatural
PLT/A	Did You See That Dogwood Bark?
PLT/A	Trees as Habitats
PLT/A	Forest Consequences

woodland activities continued

PLT/A	Fire
PLT/A	Woodwork
PLT/A	Shades of Green
PLT/A	Signs of Fall
PLT/A	Rainfall & the Forest

PW - Project Wild	**A** - Activities
PLT - Project Learning Tree	**R** - Readings

Soils Activities

PW/A	Ecoenrichers
PW/A	What's for Dinner?
PLT/A	Soil Investigations
PLT/A	What's in Soil?
PLT/A	The Touchy Feely Box

Wetland, Pond and Pool Activities

PW/A	Water's Going On?
PW/A	Pond Succession
PLT/A	A Field, A Forest and A Stream
PLT/A	Sand, Silt and Clay
PLT/A	Water You Know

Nesting Structure Activities

PW/A	My Kingdom For a Shelter
PW/A	What's That Habitat?
PW/A	Beautiful Basics
PW/A	Everybody Needs a Home

Animal Track Activities

PW/A	Wildlife is Everywhere
PW/A	Habitracks
PW/A	Urban Nature Search
PW/A	Microtek Scavenger Hunt
PLT/A	Perception
PLT/A	Schoolyard Safari
PLT/A	Web of Life
PLT/A	Schoolyard Diversity

Secondary

General Activities and Readings

PW/A	Improving Wildlife Habitat in the Community
PW/A	Planning for People & Wildlife
PW/A	What Did Your Lunch Cost Wildlife?
PW/A	History of Wildlife Management
PW/A	The Hunter
PW/A	Wildlife in National Symbols
PW/A	Animal Charades
PW/A	Adaptation Artistry
PW/A	Deer Crossing
PW/A	Shrinking Habitat
PW/A	What's That Habitat?
PLT/A	Wildlife Habitat
PLT/A	Snow Use
PLT/A	The Value of Wildlife
PLT/A	Indian Summer, Winter, Spring and Fall
PLT/A	Native American Web of Life
PLT/A	Pioneers in the Wilderness
PLT/A	Build an Ecosystem

PW - Project Wild	**A** - Activities
PLT - Project Learning Tree	**R** - Readings

Meadow Activities and Readings

PW/A	Wild Edible Plants
PW/A	Fire Ecologies
PW/A	Spider Web Geometry
PW/A	Grasshopper Gravity
PW/A	Succession Transect
PLT/A	Succession on the School Ground

Woodland Activities and Readings

PW/A	My Kingdom for a Shelter
PW/A	Rainfall & the Forest
PW/A	Succession Transect
PLT/A	A Cassette Tour of Neighborhood Trees
PLT/A	Design with Nature
PLT/A	Green Mufflers
PLT/A	The Value of 100 Acres of Forestland
PLT/A	Careers in Forestry
PLT/A	The Influence of the Forest on your Regions History
PLT/A	Why do Trees Grow There?
PLT/A	Native Americans & the Forest

woodland activities and readings continued

PLT/A	Climax Forest
PLT/A	Christmas & the Environment
PLT/A	Forest Products All Around Us
PLT/A	Nature Air Conditioners
PLT/A	The Changing Forest

PW - Project Wild **A** - Activities
PLT - Project Learning Tree **R** - Readings

Soil Activities

PW/A	I'm Thirsty
PW/A	What's for Dinner?
PLT/A	Where are the Cedars of Lebanon?
PLT/A	How You Bury a Dirt Pile

Wetland, Pond and Pool Activities and Readings

PW/A	I'm Thirsty
PW/A	Water's Going On
PW/A	Riparian Zone
PW/A	Pond Succession
PLT/A	Water We Doing?
PLT/A	We Can Work It Out
PLT/A	How Clean Is Clean?
PLT/A	Food Mobile

Nesting Structures Activities and Readings

PW/A	My Kingdom for a Shelter
PW/A	Bird Song Survey
PLT/A	Building for the Birds
PLT/A	Artisans in Wood
PLT/A	What Shall I Use To Build It?
PLT/A	What Wood Waste?

Animal Tracks

PW/A	Tracks!
PW/A	Habitrekking
PW/A	Urban Nature Search

APPENDIX B

COOPERATIVE SCIENCE PROJECTS FOR STUDENTS: AMPHIBIANS

What: Help amphibians in West Virginia by getting your students involved in research. There are two projects from which to choose: One on common terrestrial and creek salamanders and the other on frogs and toads. Your chosen study will take at least a half-day in the field to collect the data and another half-day in the classroom to analyze the data and discuss the results. Teachers are then required to return and release all amphibians at their original collection site. The findings are sent to Dr. Tom Pauley, West Virginia's leading herpetologist and coauthor of Amphibians and Reptiles in West Virginia.

Why: To find out distribution status of West Virginia salamanders, frogs or toads, and to provide an outstanding, fun and exciting project for students.

When: Projects are to be conducted in the spring months (March, April and May).

Who: The project is designed for students from grades 1-12.

How: Teachers will be provided with a lesson plan that includes background information, step-by-step procedures, questions for students, a checklist of amphibians, a key to identify the animals, and a field worksheet. Equipment will include a thermometer, pH paper, sling psychrometer and compass for the salamander study; and a dip net, pH paper and thermometer for the study on frogs and toads.

Application Procedure: Contact the WDP to request an application form. Submit your application which includes the number of students involved, why you would like to be involved in the study, teacher qualifications, and a signature from the principal acknowledging support for the project. Deadline for applications is February 1.

APPENDIX C

NEOTROPICAL MIGRATORY BIRD RESOURCE TRUNK

The Neotropical Migratory Bird Resource Trunk is an interdisciplinary, literature-based unit that provides a hands-on experience for grades K-5 that will foster awareness, tolerance, and appreciation of neotropical migratory songbirds. The resource trunk contains a Teacher's Guide, Books, Posters, Felt Storyboard, Badges, Student Research Kits, Cassette Tapes, Puppets, and much more! The Resource Trunk is available for loan to educators statewide. A $25.00 deposit and application are required to reserve the trunk and return postage from your location is paid by the borrower (Approximately $8.00-$10.00). Funding for this program is provided by the West Virginia Division of Natural Resources' Wildlife Diversity Program.

For more information contact:
West Virginia Division of Natural Resources
Wildlife Diversity Program
(304) 637-0245

APPENDIX D

BAT RESOURCE TRUNK

The Bat Resource Trunk is an interdisciplinary, literature-based unit which provides a holistic, hands-on experience that will foster awareness, tolerance, and appreciation for misunderstood bats. The materials are appropriate for grades K-6. The Resource Trunk includes classroom sets (25) of 3 books, teacher's manuals, rubber stamps, videos, audio tapes, reproducibles, posters, transparencies, games, read aloud books, puppets, and much more. A manual describing the materials found in the trunk is sent prior to receiving the resource trunk, along with free materials. The trunk also contains materials and ideas for a school-wide unit. The resource trunk is available for loan to educators statewide. A $25.00 deposit and application is required to reserve the trunk and return postage from your location must be paid for by the borrower (Approximately $10-$15). Funding for this program is provided by the West Virginia Division of Natural Resources' Wildlife Diversity Program.

For more information contact:
West Virginia Division of Natural Resources
Wildlife Diversity Program
(304) 637-0245